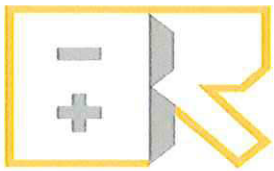

STARTUP, SHUTDOWN, AND MALFUNCTION PLAN

FOR

COMPLIANCE WITH
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM
SECONDARY LEAD SMELTING

THE BATTERY RECYCLING COMPANY
ARECIBO, PUERTO RICO

JUNE 2011

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1.0 INTRODUCTION

1.1 BACKGROUND

The Battery Recycling Company (TBRC) owns and operates a lead recycling facility in Arecibo, Puerto Rico. A system of two eight compartment baghouses is used to control particulate matter and lead emissions from smelting and refining operations at the facility. The National Emission Standards for Hazardous Air Pollutants from Secondary Lead Smelting (40 CFR Part 63 Subpart X) or Maximum Achievable Control Technology (MACT) standard, including the general provisions (40 CFR Part §63.6(e)), requires the preparation and implementation of a Startup, Shutdown, and Malfunction (SSM) Plan. The purpose of the SSM plan is to:

- Ensure that, at all times, each affected source, including associated air pollution control and monitoring equipment, is operated and maintained in a manner which satisfies the general duty requirement to minimize emissions.

- Ensure malfunctions are corrected as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants.

- Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

This plan addresses the elements that are required by the MACT standard for SSM plans.

1.2 PROCESS DESCRIPTION

Secondary lead smelting at TBRC includes three major operations: scrap pretreatment, smelting, and refining.

Scrap pretreatment is the partial removal of metal and nonmetal contaminants from lead-bearing batteries. The batteries are initially placed in an inclined conveyor which brings the batteries into a mill to be crushed and separated. In this process, the mill removes the electrolytes from the batteries and transfers the fluid through multiple sets of settling tanks. After the last set of settling tanks, the electrolyte material is sent to the facility's wastewater treatment plant. The milling machine shreds the plastic battery housings and separates the remaining battery components in water by their densities. The separation process produces solid lead (cell plates), lead oxide, separators, and plastic. The battery milling system operates independently from the facility furnaces. The operations of the milling system depends on the amount of raw material (batteries) that are available for processing and the amount of lead and lead oxide that is stored.

Sufficient amounts of lead and lead oxide are stored to allow the facility to continue to operate its smelting process even during mill ruptures. Emissions from the furnace operations are not affected by the operation of the mill. The battery crushing process is limited to the mill.

Batteries are not broken or cut before being placed in the mill conveyor, The steel casing of the large industrial batteries is removed prior to placing such batteries in the conveyor. No lead dust is generated when the steel casing is removed.

Once dried, the lead-containing separated components are prepared to be fed to the rotary furnaces for smelting. Charge preparation is the process of loading the stored lead scrap and the other raw materials (soda ash, coal, lead, lead oxides, etc..) to the proper metallurgical requirements so it can be charged to the furnaces. Materials are loaded to a rotary steel hopper. TBRC loads raw materials into the hopper using one of four tractor loaders that are available at the site. Materials are not loaded by hand. To minimize emissions during charge preparation and furnace loading, some of the following OSHA recommended measures are implemented:

- TBRC provides vehicles with enclosed cabs that have positive pressure, HEPA-filtered air or employees using the loaders are always required to use full face OSHA approved respirators.
- Surfaces are kept wet and clean through the use of the water supply systems and vacuum cleaners.
- Vehicle speeds are reduced to minimize the dust activity.
- All surfaces have been repaved to facilitate housekeeping.

The rotary furnaces are fueled with used oil. Raw materials are charged into the furnaces using a rotary steel hopper which is charged into the furnaces using a lift truck. Certain additives (soda ash, coal, etc.) are blended with the lead-containing components to achieve the desired properties of the product. Slag is removed from the furnaces, and the molten lead is then transferred to one of five identical kettles for further refining (adding various constituents to achieve desired product properties). During the refining process, waste dross is skimmed from the top of the kettles and removed for later use. After the refining process has been completed, the lead is shaped into ingots (either round or square, depending on the customer's specification).

TBRC's operations do not include a blast furnace, dryer, or an agglomerating furnace; therefore, the requirements in the MACT standard related to these emission sources are not applicable.

Currently, the rotary furnaces, kettles, and process fugitive sources (lead taps and slag taps) are all exhausted to two eight-module baghouse units which discharge to a joint stack. A separate area was built for the ingot preparation. This area is equipped with a exhaust system that collects emissions to be sent to the baghouses. The baghouse modules exhaust through a common stack. The bags are cleaned by the shaker method. A particle detector is installed on the stack to help ensure proper operation of the baghouse. The dust generated by the baghouses is collected, stored and reused in the smelting furnaces.

2.0 OPERATING LIMITS AND COMPLIANCE WITH 40 CFR PART 63, SUBPART X

The following TBRC sources are subject to emission limits under 40 CFR Subpart X:

- Furnace gases:
  - 0.00087 grains per dry standard cubic foot (40 CFR 63.543(a))
- Furnace molds and taps (lead and slag, during tapping), 3 Refining Kettles:
  - 0.00087 grains per dry standard cubic foot (40 CFR 63.544(c))

In order to comply with these limits, TBRC routes exhaust from the affected sources to two baghouses. Each baghouse are equipped with a bag leak detection system that detects abnormal concentrations of particulate in the exhaust. The detection system alarms once particulate is detected above preset levels (40 CFR 63.548(e)(3)).

The baghouse is operated in accordance with a standard operating procedure (SOP) prepared pursuant to 40 CFR 63.548(a). This procedure includes a corrective action plan that contains TBRC's response to a bag leak detection system alarm (40 CFR 63.548(f)). If a baghouse is not operational, the furnace controlled by such baghouse is shut down to minimize excess emissions that may occur due to a problem with the baghouse.

3.0 PROCEDURES

A malfunction is any sudden, infrequent, and not reasonably preventable failure of the air pollution control equipment, the process equipment, or a process to operate in a normal or usual manner, which causes or has the potential to cause a violation of an emission limitation. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

Ruptures of the battery breaker/mill only affect the amount of raw material that is available for the process. Such ruptures do not have a potential to cause an exceedance of an emission limitation. Accordingly, such events are not covered by this Plan.

Similarly, charge preparation activities do not have a potential to cause an exceedance of an emission limitation. Accordingly, such events are not covered by this Plan.

The front of each furnace is hooded and enclosed. Entrance to the furnaces is made through four front steel access doors. Raw materials are charged into the furnaces using a steel hopper which is charged into the furnaces using a lift truck. To charge the furnaces, the front doors must be first opened to allow the lift truck to reach the furnaces' charging doors. Emissions during the charging are controlled by a hood with sufficient exhaust ventilation to capture the dust that may be generated by the charging procedure. The face velocity of the hoods have been measured with the front doors closed and open. Face velocity measurements have demonstrated compliance with MACT under both scenarios. The front of the furnaces and the hoods are designed to prevent and minimize emissions of dust during the charging and tapping process. Accordingly, charging and tapping fugitive emissions are adequately controlled regardless of whether the furnaces' front doors are opened or closed. Nevertheless, BRC has implemented administrative measures to ensure that the furnaces' front steel doors remain closed except during charging and tapping procedures.

The cause of these events should be investigated immediately as a potential malfunctions:

- Failure of the Bag Leak Detection System (more than 8 hours) or Baghouse Compartments (3 or more compartments)
- Visible emissions from the baghouse stack
- Apparent loss of power at the baghouses
- Abnormal visible emissions from a process fugitive source

3.1 STARTUP/SHUTDOWN

Each of the baghouse startup and shutdown procedures are automated. There are start and stop buttons for the startup and shutdown of each unit on the individual unit's control panel. Each baghouse cell can also be individually taken off-line and locked out for maintenance activities. The furnaces are also equipped with a start and stop button and interlocks with the corresponding baghouse. Each furnace is equipped with an automatic interlock which shutdowns the affected furnace's burner in the event that the baghouse fan ceases to operate due to a malfunction or loss

of power. Specific startup and shutdown procedures for the equipment at the facility can be found in Appendix A.

During startup, shutdown, and malfunction events, the Baghouse SOP must continue to be followed.

3.2 BAG LEAK DETECTION ALARM

The corrective action plan section of the *Baghouse Standard Operating Procedures Manual* contains the procedures that are followed upon discovery of a baghouse leak detection system alarm.

3.3 WHAT TO DO FOR ANY MALFUNCTION

1. Contact the Shift Supervisor immediately and proceed with the malfunction diagnosis and correction procedures described below.
2. If the procedures in this Plan do not address or adequately address the malfunction that has occurred, the operator should attempt to correct the malfunction with the best resources available. The Shift Supervisor should be notified of the situation immediately.
3. Notify the Shift Supervisor within 15 minutes of the progress of the diagnosis and correction procedures and status of the malfunction.
4. If the malfunction causes or has the potential to cause an exceedance of a a standard and if the malfunction cannot be corrected within an hour, notify the Shift Supervisor and proceed to shut down the control device and the equipment venting to the control device.
5. If the malfunction is corrected within an hour, notify the Shift Supervisor as soon as the control device or equipment is operational.
6. If the procedures in this Plan do not address or adequately address the malfunction that has occurred, the operator or supervisor should note the circumstances and the actual steps taken to correct the malfunction in the Deviation, Excursion, or Malfunction Occurrence Report Form (Appendix B). This Plan will need to be revised based on this information, as described below.
7. Follow procedures in Section 4.0 (Recordkeeping Data and Notification), as appropriate, to adequately document, notify, and report the malfunction.

3.4 VISIBLE EMISSIONS FROM THE BAGHOUSE STACK

1. Check all baghouse parameters: power indicator light, pressure drop, and fan operation to determine the cause of the increase in opacity.
2. Manually take offline each cell and inspect bags for leaks. If leaks are found, replace bags.
3. Re-check the stack for visible emissions. (Steam is not considered a visible emission. Steam plumes are white in color and have a billowy consistency. Steam plumes dissipate within a short distance from the stack and leave no dispersion trail downwind of the stack.) If results of the stack check indicate any continuing visible

emissions and the cause of baghouse malfunction cannot be determined within an hour, notify the Shift Supervisor of the continuing situation and shutdown of the affected sources venting to the baghouse.
4. Follow the procedures in Section 3.3 for what to do for any malfunction.

3.5 LOSS OF POWER

1. The process interlock between the furnace and the baghouse will prevent excess emissions from occurring during a loss of power (i.e., the furnace burner will not fire if the baghouse is not operational).
2. If the power is lost for more than 15 minutes, manually shutdown the kettles.
3. Follow the procedures in Section 3.3 for what to do for any malfunction.

3.6 MISCELLANEOUS SPECIFIC PROCEDURES

3.6.1 Abnormal Process Fugitive Emissions, including Tapping

1. Review the integrity of the process fugitive hood system (furnace charging, furnace lead and slag taps, and kettles) to identify leaks, gaps, warping, or other abnormalities in the capture system. Verify that there are no obstructions in the exhaust system that would impact airflow. There should be an inflow of air into the hood or capture system. Review the procedures in Appendix A.
2. Follow the procedures in Section 3.3 for what to do for any malfunction.

3.6.2 Failure of Bag Leak Detection System or Baghouse Compartments

1. The baghouses showed compliance with both the NSPS and MACT standard operating without 2 of the 8 compartments. Therefore, in the event of a failure of the Bag Leak Detection System (i.e., the Triboflow unit) that last in excess of 8 hours, and during periods in which more than two of the baghouse compartments are taken out of service due to malfunctions, repairs, maintenance or replacements, the facility must follow the procedures in Section 3.3 and *Baghouse Standard Operating Procedures Manual* for what to do for any such events, and,
2. Until the Bag Leak Detection System is repaired or no less than six baghouse compartments are operated, the shift supervisor, or his designee will monitor the baghouse exhaust once per day (during daylight hours) to determine the presence of visible emissions. Observations will be conducted by an observer trained to distinguish steam emissions, which are not visible emissions, from smoke emissions. If visible emissions are observed, follow the procedures in Section 3.4 for what to do if there are visible emissions from the baghouse stack.

4.0 RECORDKEEPING DATA AND NOTIFICATION

4.1 MALFUNCTION DATA TO RECORD

If the procedures in this Plan do not address or adequately address the malfunction that has occurred, the operator or supervisor should note the circumstances and the actual steps taken to correct the malfunction in the Deviation, Excursion, or Malfunction Occurrence Report Form (Appendix B):

- Date and time the malfunction occurred
- Duration of the malfunction
- Actions taken to correct the malfunction
- If the procedures in this Plan were followed
- If the procedures of this Plan were not followed, the reason for not following the procedures
- Any recommended revisions to the Plan to better accommodate malfunctions such as that which has occurred
- Other information as indicated on the Deviation, Excursion, or Malfunction Report Form

4.2 WHOM TO NOTIFY

1. The Shift Supervisor should be notified immediately of the malfunction.
2. The Shift Supervisor should be notified within 15 minutes of progress with the malfunction.
3. If the malfunction causes or has the potential to cause an exceedance of a a standard and if the baghouse malfunction cannot be corrected within an hour, the Shift

Supervisor should be notified and procedures to shut down the baghouse and the affected sources venting to the baghouse should be initiated. See Appendix A for furnace shutdown procedures.

4. Contact the Plant Sub-Manager for help in correcting the problem.
5. If the problem persists, contact the Plant Manager.
6. The Deviation, Excursion, or Malfunction Occurrence Report Form should be completed by the operator on duty prior to the end of the shift or no later than 24 hours following the malfunction and submitted to the Shift Supervisor.
7. The Shift Supervisor should review and sign the Deviation, Excursion, or Malfunction Report Form and submit a copy to the Plant Manager. The original form should be retained for five (5) years.

Appendix B contains a form for recording a malfunction and the corrective action taken.

4.3 WHAT TO REPORT

1. If the actions taken during the malfunction were consistent with this Plan, submit a letter with the periodic report or include a description in such report to the Environmental Quality Board (EQB) and the U.S. Environmental Protection Agency (EPA). This statement is due within 30 days following the end of each 6-month period and should include the following information:
   - Name and title of Shift, Environmental Manager, or Plant Manager
   - Certifying signature of the owner/operator or other responsible official
   - Statement that the actions taken during the malfunction were consistent with the Plan and
   - A copy of the Deviation, Excursion, or Malfunction Occurrence Report Form

2. If the actions taken during a malfunction were not consistent with this Plan, the Environmental Manager or Plant Manager should report the actions taken to the EQB and EPA by telephone or facsimile (FAX) transmission within two (2) working days after the malfunction. A letter must then be sent within seven (7) working days after the malfunction. The letter should include the following information:

   - Name and title of Shift, Environmental Manager, or Plant Manager
   - Certifying signature of the owner/operator or other responsible official
   - A copy of the Deviation, Excursion, or Malfunction Report Form
   - Detailed explanation of the circumstances of the malfunction
   - The reasons the Plan was not adequate
   - Whether any excess emissions and/or parameter monitoring exceedances are believed to have occurred during the event

3. If the actions taken during the malfunction were not consistent with this Plan, the Environmental Manager or Plant Manager at BRC must:

- Revise this Plan within 45 days after the malfunction to include procedures for operating and maintaining the equipment during similar malfunction events.
- Include the revised Plan in the periodic report (due within 30 days following the end of each 6-month period).

Note: If the revisions to the Plan alter the scope of the process activities at BRC or otherwise modify the applicability of any emission limit, work practice requirement, or other requirement in 40 CFR Part 63, Subpart X, the revised Plan is not effective until written notice has been provided to the EQB describing the Plan revision(s).

4.4 NON-MACT REPORTING REQUIREMENTS

This section has been included in order to comply with other non-MACT reporting requirements related to the operation of the air emission control system.

1. In order to comply with EQB Rule 603(a)(5)(ii)(a), for each deviation or malfunction, forward a copy of the Deviation, Excursion, or Malfunction Occurrence Report Form or a copy of a completed corrective action plan section of the *Baghouse Standard Operating Procedures Manual* to the EQB within 2 working days.

2. In order to comply with EQB Rule 603(a)(5)(ii)(b), for each deviation or malfunction during which operations continued uncontrolled for a period of more than 1 hour, forward a copy of the Deviation, Excursion, or Malfunction Occurrence Report Form or a copy of a completed corrective action plan section of the *Baghouse Standard Operating Procedures Manual* to the EQB within 24 hours, regardless of their completeness. Within 7 days of such an occurrence, submit the finalized copy of the Deviation, Excursion, or Malfunction Occurrence Report Form or a copy of a completed corrective action plan section of the *Baghouse Standard Operating Procedures Manual* to the EQB (Title V notification procedures will become effective upon the issuance of the facility's Title V permit).

3. In order to comply with Emergency Planning Community Right-to-Know Act (EPCRA) requirements found at 40 CFR 355.40, for each deviation or malfunction that results in an uncontrolled release of 10 pounds of lead[1], IMMEDIATELY call the National Response Center (800-424-8802), and provide the following information:

    - The chemical name of any substance involved in the release (Lead)
    - Indication of whether the substance is an EHS (Lead is <u>not</u> an EHS)

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[1] The facility's lead emission limit under the Secondary Lead Smelting (40 CFR Part 63 Subpart X) or Maximum Achievable Control Technology (MACT) is as follows:

- Furnace gases:
    - 0.00087 grains per dry standard cubic foot (40 CFR 63.543(a))
- Furnace molds and taps (lead and slag, during tapping), 3 Refining Kettles:
    - 0.00087 grains per dry standard cubic foot (40 CFR 63.544(c))

- Estimate of the quantity of any such substance that was released into the environment (Assume 1 pound per minute of equipment operation while the baghouse control system was not operating properly)
- The time and duration of the release
- The medium into which the release occurred (Air)
- Any known or anticipated acute or chronic health risks and advice regarding medical attention for exposed individuals (None expected)
- Proper precautions to take as a result of the release (None)
- Names and telephone number of the facility contact person

As soon as practicable after a reportable release, provide a written report updating any of the information required above that needs revision, and provide the following:

- Corrective actions taken to respond to the release
- Anticipated health risks associated with the release (None expected)
- Advice regarding medical attention for exposed individuals (None expected)

5.0 UPDATING THE PLAN

If an action taken by TBRC during a start-up, shutdown, or malfunction (including an action taken to correct a malfunction) is inconsistent with the SSM Plan, including referenced documents, and BRC exceeds the grain loading in the MACT standard, then BRC must record the actions taken for the event and report the event to the Puerto Rico Environmental Quality Board (EQB) and the U.S. Environmental Protection Agency (EPA) within two (2) working days after commencing the actions that were inconsistent with the SSM Plan, followed by a letter within seven (7) working days after the end of the event.

The reporting addresses for the EQB and the EPA are:

Manager, Air Quality Area
Puerto Rico Environmental Quality Board
P.O. Box 11488
Santurce, Puerto Rico 00910
Phone: (787) 767-8056
Facsimile: (787) 767-4861

Director
Air Protection Division
U.S. Environmental Protection Agency
Region II
290 Broadway
New York, New York 10007-1866
Telephone: (212) 637-5000
Facsimile: (212) 637-3526

CARIBBEAN ENVIRONMENTAL PROTECTION DIVISION?
Director
Centro Europa Building
1492 Ponce De León Avenue, Suite 417
San Juan, PR 00907-4127
Phone: 787-977-5870
Fax: 787-729-7747

APPENDIX A

EQUIPMENT PROCEDURES

APPENDIX B

MONITORING, RECORDKEEPING, AND REPORTING FORMS

Includes the following:

1) Deviation, Excursion, or Malfunction Occurrence Report

The Battery Recycling Company
Deviation, Excursion, or Malfunction Occurrence Report

Complete for the following:

- Failure of the Bag Leak Detection System and more than 2 Baghouse Compartments at the same time
- Visible emissions from the baghouse exhaust stack
- Power outage lasting longer than 15 minutes
- Abnormal visible emissions from process fugitive emission sources

Description of deviation, excursion, or malfunction:
Date/time of start time of deviation, excursion, or malfunction:
Corrective actions and response steps taken (attach additional pages, as needed): Were Start-up, Shutdown, and Malfunction Plan Procedures Followed?
Date/time corrective actions taken:
Describe the cause of the deviation, excursion, or, malfunction:
Date/time deviation, excursion, or malfunction ended:
Was the Shift Supervisor notified immediately of the deviation, excursion, or malfunction?:
Was the Shift Supervisor informed of progress of the corrective action within 15 minutes of the deviation, excursion, or malfunction?:
Units shut down as a result of the deviation, excursion, or malfunction:
If applicable, describe the reasons why continued operation of the facilities are necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value:

Form completed by: _____ Title: _____

Phone: _____ Date: _____

Supervisor on Duty: _____ Supervisor Title: _____

Supervisor Comments:

Supervisor Signature: _____ Date: _____

MAINTAIN THIS DATA SHEET ON FILE FOR 5 YEARS.

*NOTE: Complete "Bag Leak Detection System Alarm Corrective Action Plan" form for alarms from broken bag detector. This form is included with the Baghouse Standard Operating Procedure.